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(74) Agent: JOHN AND KERNICK; P.O. Box 3511, 1685 Halfway House (ZA).		<p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>	
<p>(54) Title: CAMERA SYSTEM REMOTELY CONTROLLED OVER A COMMUNICATION NETWORK</p>			
<p>(57) Abstract</p> <p>This invention relates to a communication system and more particularly, but not exclusively, to a visual and audio communication system. The communication system consists of a video camera which is connected to a portable wireless transceiver. An image from the video camera is transmitted from the wireless transceiver to a signal repeater from where the video signal is transmitted over a telephony communication system to a second transceiver. The second transceiver is arranged to display the video signal on a display means. A first control device is connected to the second transceiver for transmitting a control signal over the telephony communication system to the signal repeater and from the signal repeater to the portable wireless transceiver and to a second control device connected to the portable transceiver for controlling the video camera or an operator of the video camera. The classification is H04N, H04M, H04L.</p>			

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CAMERA SYSTEM REMOTELY CONTROLLED OVER A COMMUNICATION NETWORK

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COMMUNICATION SYSTEM**FIELD OF THE INVENTION**

This invention relates to a communication system and more particularly, but not exclusively, to a visual and audio communication system.

BACKGROUND TO THE INVENTION

It is often necessary to inspect a site such as a building site, a factory, or any other dwelling.

- 5 Where such a site is located at a remote location, on-site inspections can be very time consuming and expensive.

OBJECT OF THE INVENTION

It is the object of this invention to provide a communication system which, at least partially, alleviates some of the abovementioned difficulties.

SUMMARY OF THE INVENTION

In accordance with this invention there is provided a communication system comprising a video camera connectable to a portable wireless transceiver for transmitting a video signal from the video camera to a signal repeater from where the video signal is transmitted over a communication system to a second transceiver arranged to display the video signal on a display means, and a first control device connectable to the second transceiver for transmitting a control signal over the telephony communication system to the signal repeater and from the signal repeater to the portable wireless transceiver and to a second control device connected to the portable transceiver.

- 5 10 A further feature of the invention provides for the communication system to be a telephony communication system.

There is further provided for the first and second control devices to be audio communication devices.

- 15 There is alternatively provided for the first control device to electronically control the video camera and to at least control the azimuth and elevation of the video camera.

A still further feature of the invention provides for the signal repeater to be located in an aeroplane for relaying video and/or control signals between a remote site and a base station.

- 20 25 A further feature of the invention provides for the first audio communication device to be a microphone and for the second audio communication device to be a loudspeaker or vice versa; alternatively, for both the first and second communication devices to have a microphone and a loudspeaker each to allow for two way audio communication.

- 30 There is provided for the telephony communication system to be land based telephone lines; alternatively, for the telephony communications system to be a cellular telephony communication system; further alternatively for the telephony communication device to be a satellite telephony system.

- There is further provided for the microphone of the second communication device to be a microphone of the video camera.

This invention extends to a method of inspecting a remote site comprising the steps of connecting a video camera and at least a loudspeaker to a portable wireless transceiver, connecting a signal repeater at a remote site to a telephony communication system, connecting a second transceiver at a base station to the 5 telephony communication system, connecting a display means to the transceiver and connecting a microphone to the second transceiver, displaying a video signal from the video camera at the remote site on the display means and transmitting a control signal from the first control device to the second control device.

BRIEF DESCRIPTION OF THE DRAWINGS

10 Preferred embodiments of the invention is described below by way of example only and with reference to the accompanying drawings in which :

Figure 1 shows a schematic representation of a first embodiment of a communication system; and

15 Figure 2 shows a schematic representation of a second embodiment of a communication system.

DETAILED DESCRIPTION WITH REFERENCE TO THE DRAWINGS

With reference to the drawings, in which like numerals refer to like features, a communication system is generally indicated by reference numeral (1).

20 The communication system consists of a video camera (2), a first and second control devices (8) and (9), a portable wireless transceiver (3), a signal repeater (4), a telephony communication system (5), a second transceiver (6) and a display means (7).

In this embodiment the display means (7) is a computer screen. The first and second control devices (8) and (9) are audio communication devices which consists of headsets with a microphone each and each having a loudspeaker.

25 The video camera (2) and second audio communication device or second headset (9) is connected to the portable wireless transceiver (3) for use at a remote location (10).

The signal repeater (4) is connected to the telephony communication system (5) at the remote location (10).

5 The second transceiver (6) is connected at a base station (11) to the telephony communication system (5) to allow for communication between the remote location (10) and the base station (11).

The first audio communication device or first headset (8) and the display means (7) is connected to the second transceiver (6).

10 In use, the video camera (2) transmits a video signal to the portable wireless transceiver (3) which then transmits the video signal to the signal repeater (4). The signal repeater (4) receives the video signal and transmits it over the telephony communication system (5) to the second transceiver (6). The second transceiver (6) now causes the video signal to be displayed on the computer screen (7).

15 A voice signal is also transmitted from the first headset (8) to the second transceiver (6) which then transmits the voice signal over the telephony communication system (5) to the signal repeater (4). From the signal repeater (4), the voice signal is transmitted to the portable wireless receiver (3) and to the second headset (9).

20 25 In this way a camera operator at the remote location (10) can transmit video images of the remote location (10) to the base station (11). A person at the base station (11) can transmit verbal instructions to the camera operator at the remote location (10). Any remote location can thus be inspected by a person at a base station. This obviates the need for such a person to be physically present at the remote location to conduct an inspection.

30 25 A two way voice communication link can also be established between the camera operator and the person at the base station (11). In this case a voice signal can also be transmitted from the second headset (9) to the first headset (8) through the communication system (1). It will be appreciated that only a one way voice communication link as described above would be necessary to instruct the camera operator.

5 The camera does not have to be operated by a human operator. The camera may be mounted on an adjustable mounting means at a site to be inspected. An electronic control signal from the first control device which may be a computer may then control the view direction, ie panning and tilt, of the camera and other functions of the camera itself. The camera may also be mounted such that the direction in which it points does not have to be changed or cannot be changed. Camera functions only may then be controllable from a base station.

10 The telephony communication system used may be based on land telephone lines, cellular telephone systems or satellite telephone systems as is known in the art.

15 While the camera (2) transmits images to the base station (11), the same images may be recorded on a video cassette inserted in the camera. A camera using a digital video disk or the like may also be used.

20 Figure 2 shows a second embodiment of a communication system. In this embodiment, a second portable display means (12) is connected to the first transceiver (3).

25 A wireless connection is established between the second transceiver (6) and a third transceiver (13). The display means (7) and the second control device (8) are now connected to the third transceiver (13). In this embodiment, the display means (7) is a portable display means. A second video camera (14) is also connected to the third transceiver (13). The communication system shown in figure 2, in effect replaces the components of the base station (11) of figure 1 with the components of the remote location (10) of figure 1. The display means (7) is now portable and a similar portable display means is connected to the first transceiver (3) of the remote location (10) of figure 1.

30 The remote location (10) and base station (11) are no longer clearly distinguishable and any end of the communication system of figure 2 can act as either a base station or a remote location. A operator at one end can view what the operator at the other end is filming and vice versa.

35 Other non-portable display means (15) can be connected as shown to show images being shot by any one of the video cameras. Recording means (16) may also be used to record images and/or control signals and/or voice signals on magnetic tape or on any other convenient recording media.

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As shown in figure 2, a series of first (3) and third (13) transceivers each having a camera (2) and (14), a portable display (12) and (7) and a headset (9) and (8) connected thereto, are employed.

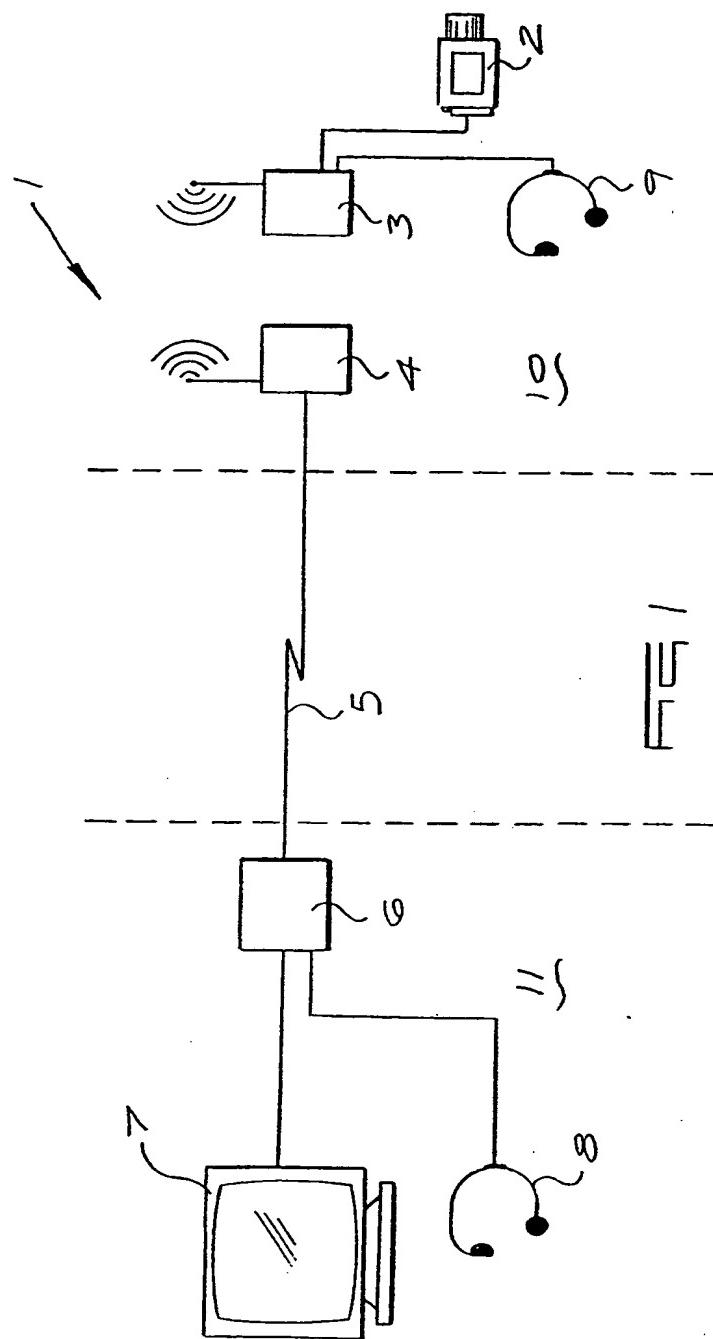
Other electronic control means may replace the headsets (9) and (8) to electronically control azimuth and elevation of a camera, zoom function of a camera or any other controllable function of a camera.

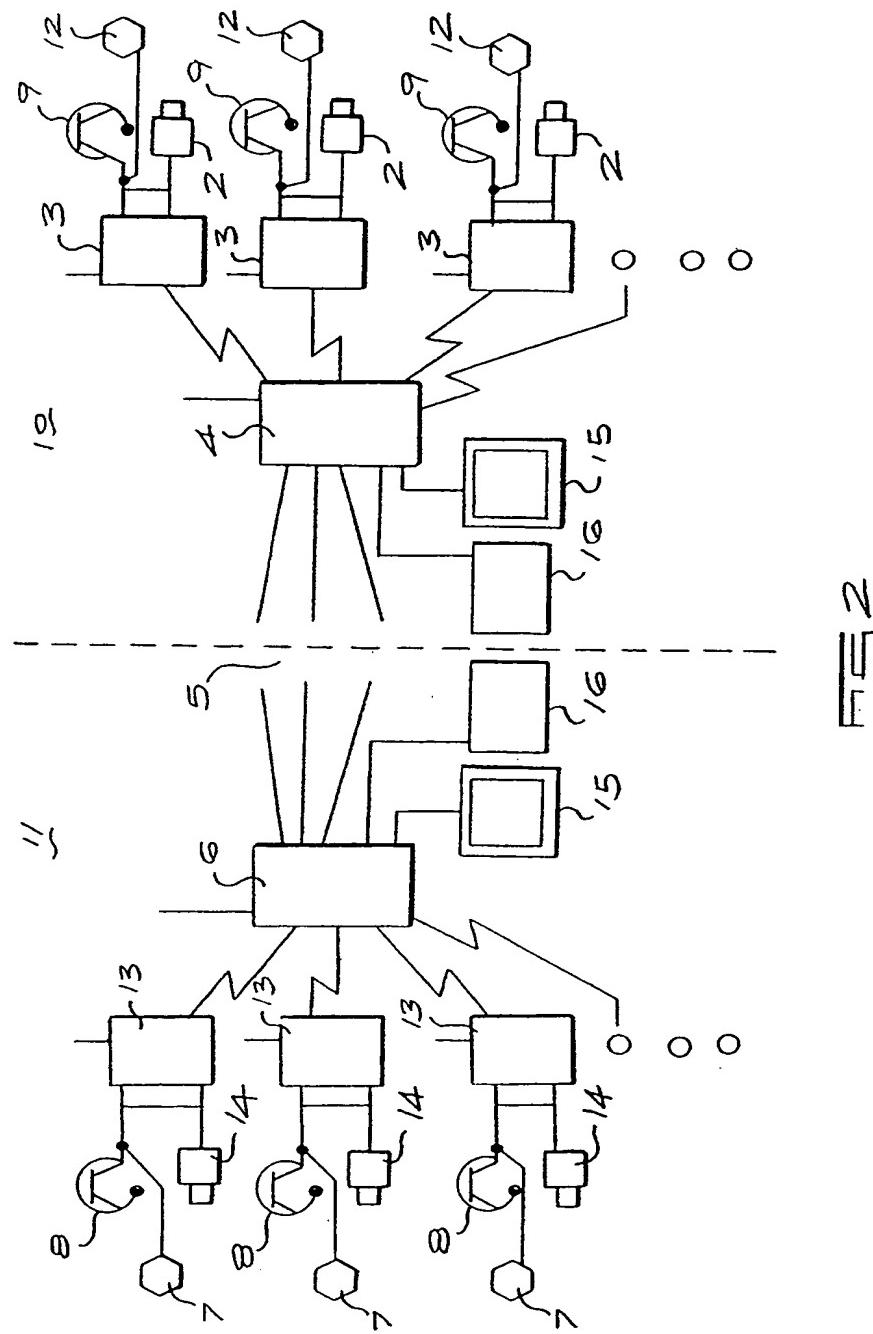
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CLAIMS

1. A communication system comprising a video camera connectable to a portable wireless transceiver for transmitting a video signal from the video camera to a signal repeater, from which the video signal is transmitted over a telephony communication system to a second transceiver arranged to receive the video signal and to display it on a display means, and a first control device connectable to the second transceiver for transmitting a control signal over the telephony communication system to the signal repeater and from the signal repeater to the portable wireless transceiver and to a second control device connected to the portable transceiver.
2. A communication system as claimed in claim 1 in which the video camera is electronically controllable by the first control device.
3. A communication system as claimed in any one of the preceding claims in which azimuth and elevation of the video camera are electronically controllable by the first control device.
4. A communication system as claimed in claim 1 in which the first and second control devices are audio communication devices.
5. A communication system as claimed in claim 4 in which the audio communication devices provide at least a one way voice communication link from the first control device to the second control device.
6. A communication system as claimed in any one of the claims 4 or 5 in which at least the second control device includes a headset having a loudspeaker.

7. A method of inspecting a remote site with a communication system comprising the steps of connecting a video camera and a second control device to a portable wireless transceiver at the remote site, connecting a signal repeater at the remote site to a telephony communication system, connecting a second transceiver at a base station to the telephony communication system, connecting a display means to the second transceiver and connecting a first control device to the second transceiver, displaying a video signal from the video camera at the remote site on the display means and transmitting a control signal from the first control device over the telephony communication system to the signal repeater and to the second control device connected to the wireless transceiver.
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8. The method as claimed in claim 7 in which the first and second control devices are used to electronically control the video camera.
- 15
9. The method as claimed in claim 7 in which the first and second control devices are audio communication devices.





INTERNATIONAL SEARCH REPORT

International Application No
PCT/ZA 99/00106

A. CLASSIFICATION OF SUBJECT MATTER					
IPC 7	H04M11/04	H04M11/00	G08B15/00	H04N5/232	H04N7/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N G08B H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 256 771 A (CABLE SRL) 16 December 1992 (1992-12-16) page 1, line 4 - line 20 page 4, line 2 -page 10, line 15 ---	1,7
Y	US 4 954 886 A (ELBERBAUM DAVID) 4 September 1990 (1990-09-04) column 3, line 32 - line 50 column 6, line 65 -column 7, line 10 column 8, line 28 - line 49 ---	2-6,8,9
Y	US 4 326 221 A (MALLOS GENE G ET AL) 20 April 1982 (1982-04-20) column 1, line 12 - line 34 column 1, line 47 -column 9, line 14 -----	2,3,8
Y	US 4 326 221 A (MALLOS GENE G ET AL) 20 April 1982 (1982-04-20) column 1, line 12 - line 34 column 1, line 47 -column 9, line 14 -----	4-6,9

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Information on patent family members

Int. onal Application No
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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
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		ES	2038930 B	16-02-1997
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